



Dryden Flight Research Center
Edwards, California 93523-0273

DOP-O-300
Revision: C

Dryden Organizational Procedure

CODE O

FLIGHT OPERATIONS MANUAL

Electronically Approved by:
Director, Flight Operations Directorate

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DOCUMENT HISTORY PAGE

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PREFACE

DOP-O-300 DRYDEN FLIGHT RESEARCH CENTER CODE O FLIGHT OPERATIONS MANUAL is in accordance with NASA Policy Directive (NPD 7900.4A) NASA Aircraft Operations Management. It is issued pursuant to the authority of the Director, Dryden Flight Research Center, and prescribes standard operating procedures and instructions pertaining to the operation of aircraft assigned to Dryden and to related aircraft operations involving Dryden. This manual will be used in conjunction with other governing instructions, regulations, and procedures. When the need arises, special instructions or waivers will be issued by O/Director for Flight Operations with Center Director approval. Such special instructions will be incorporated in the manual as the situation dictates.

SUPPLEMENTS

Between revisions, supplements will clarify, change, or add to this Operations Manual will be in the form of supplements. Supplements will be identified as OS-1, OS-2, etc. A log sheet for pilots to initial indicating acknowledgement of supplement will also be utilized. As supplements are cancelled, the log will so note. Supplements will only be maintained with the reference copy of the Operations Manual, on file in the Pilots Office.

Comments and recommendations concerning this manual are encouraged and should be submitted to Code O/ Dryden Director for Flight Operations.

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CHAPTER 1: FLIGHT OPERATIONS - GENERAL PROCEDURES

1. FLIGHT CLEARANCE AUTHORITY - NASA PILOT DESIGNATION

Research pilots employed at Dryden Flight Research Center have the designation "NASA Research Pilot". This designation identifies pilot clearance authority comparable to the USAF Command Pilot level. The Director for Flight Operations will establish the research piloting authority of these pilot personnel. Research pilots who are test pilot qualified are designated as Research Test Pilots.

2. ASSIGNMENT OF PROJECT PILOTS

For each research flight program conducted by Dryden Flight Research Center, project pilots and project co-pilots will be assigned. Such assignments will be made by the Chief, Flight Crew Branch and concurred with by the Director for Dryden Flight Operations. (Military pilots assigned to Dryden programs are required to be fully qualified for the program, as determined by the Chief, Flight Crew Branch and the Director for Flight Operations). Each Airborne Science deployment will have an assigned project pilot to work flight operations issues relative to that deployment.

3. AIRCREW DEFINITIONS

- a. Primary Aircrew: Pilots, Flight Engineers, and Navigators, both civil service and contractor, that are assigned to the Dryden Flight Operations Directorate. Training is documented in aircrew flight record file and kept at the operations desk (ER-2 training records are maintained in ER-2 Operations). NASA astronauts and other NASA center pilots are considered primary aircrew for the purpose of flight approval. Contractor pilots, U. S. military pilots, and other pilots covered by MOU are considered primary aircrew for purposes of approval and are required to complete any training directly related to specific research projects to which assigned.
- b. Attached Aircrew: Other flight crew positions needed to accomplish the Dryden mission that occupy a seat with flight controls or have emergency procedure responsibilities aboard an aircraft, such as: Flight Test Engineer, Launch Panel Operator, B52 Crew Chief, Mission Manager, DC8 Technicians, Engineers, Photographers, and Flight Surgeon. Training records are kept in life support.

4. APPROVAL TO FLY IN DRYDEN AIRCRAFT

- a. The Chief, Flight Crew Branch, makes primary aircrew assignments. See Chapter 3 for Primary Aircrew Qualifications and Checkout Requirements. NASA Dryden and contractor primary aircrew will maintain a record file (flight jacket) to include: Emergency notification data, initial qualification records, formal flight schooling, recurring simulation and emergency procedure training as determined by the aircraft monitor, and other familiarization or training records. To fly in other Dryden aircraft,

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primary aircrew will require written approval from the Chief Pilot and documented by DFRC Form 176 (Authorization/Training to fly in NASA Dryden Aircraft). Non-Dryden primary aircrew require written approval in accordance with table 1 and documented by DFRC Form 176.

- b. All personnel flying as observers (typically, one-time flights for orientation or familiarization purposes) or attached aircrew in aircraft assigned to the Dryden Flight Research Center will require written approval in accordance with Table 1. These approvals will be established by use of DFRC Form 176.
- c. Approval for NASA Dryden employees to fly in non-Dryden controlled aircraft is covered in CHAPTER 2: JOINT FLIGHT PROGRAMS.

APPROVAL AUTHORITY REQUIRED (Table 1)

	Employee Branch Chief	Employee Directorate	Project Manager ①	Code OF	Code O	Code X	Code Y	Justification Block Req'd	Form 176 ③
Code OF Primary Aircrew				✓				NO	YES
Other NASA Center Aircrew/ Aircrew covered By MOU				✓	✓			NO	YES
Dryden Attached Aircrew Dryden Non-Aircrew	✓	✓	✓	✓	✓			YES	YES
Non-Dryden Aircrew/ Research Proj Non-Aircrew			✓	✓	✓			YES	YES
Dryden Assigned Contractor	✓	✓	✓	✓	✓			YES	YES
All other Non-Dryden Persons (except below)		✓	✓	✓	✓	✓ ②		YES	YES
DC-8 Aircraft Experimenters and Maintenance Crews							✓	Code Y	NO

① Project Manager, if appropriate, COTR and Contractor Supervisor Req'd. As additional information, the project manager will indicate on the Form 176 if an AFSRB/ORR is required and complete.

② May require NASA HQ approval or may be delegated to Code O by letter.

③ Required prior to first flight, for one-time flights, or if training non-current. Passenger only status does not require a Form 176.

5. APPROVAL OF FLIGHTS AND AIRCRAFT

- a. Individual research flights must be requested formally through a flight request DFRC Form 110 approved by the Director of the originating organization. These flights must then be approved by the Director for Flight Operations, who is responsible for ensuring that aircrew assigned for specific research flights have been officially approved to serve in the assigned capacity - and have met the qualifications therefore - as established by Dryden policies and procedures. Any flight which includes flight outside of the normal flight envelope, as defined by the aircraft flight manual, or

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involves out-of-control maneuvers, will be treated as a research flight, to include submittal of a flight request, unless specifically exempted below:

- (1) F-18 high angle of attack training maneuvers conducted within the flight manual limitations are exempt from the flight request requirement.
 - (2) T-34 spin training maneuvers, conducted with an instructor pilot onboard, are exempt from the flight request requirement.
- b. Local area research support, maintenance, test training, and proficiency flights by Dryden aircrew must be approved by the Dryden Chief, Flight Crew Branch or his/her designated representative, the Operations Duty Officer, who will be a Dryden pilot or Flight Operations Management. Approval will be documented with the NASA Flight Plan (Flight Operations Form 22).
- (1) The Dryden pilot or Flight Operations Management person who authorizes any local flight plan is the Operations Duty Officer for the duration of that flight. It is the responsibility of the Duty Officer to be readily available to the Flight Operations radio during this time.
 - (2) Research flights conducted through the Dryden control rooms that have a designated senior Flight Operations representative with access to the appropriate flight manuals do not require designation of an Operations Duty Officer. The Director of Flight Operations will designate personnel who can function as senior Flight Operations representatives.
 - (3) Local round-robin proficiency flights may be conducted using a DD-175 flight plan, or equivalent. If conducted using a flight plan, an Operations Duty Officer is not required.
- c. Either the Director for Flight Operations or the Director, Airborne Science, or their designated representatives, are delegated the authority to schedule and approve individual DC-8/ER-2 flights provided the flight is to accomplish (1) part of a NASA Headquarters approved flight request, (2) required to maintain DC-8/ER-2 pilot proficiency, or (3) a functional check flight for the aircraft or science instrument(s). Approval will be documented on the DFRC DC-8 Flight Manifest, DFRC ER-2 Flight Authorization form or the ER-2 Weekly Flight Authorization form. A qualified or experienced ER-2 pilot will be available in the ER-2 operations room for communications with the ER-2 while airborne.
- d. All flights of Dryden aircraft piloted by other than Dryden pilots require the approval of the Dryden Director for Flight Operations, or his/her representative. Requests and approval will be documented with , DFRC Form 176, Authorization/ Training to Fly in NASA Dryden Aircraft.
- e. Cross-country proficiency flights require the approval of the Director for Flight Operations. Cross country flights conducted using a flight plan do not require an Operations Duty Officer. Requests and approval will be documented with Flight Operations Form 21, Flight Authorization.

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- f. Exceptions to the above documentation requirements will be made on a case-by-case basis by the Director for Flight Operations. However, all flights will be documented appropriately within the intent of the above requirements.

6. SCHEDULING OF FLIGHTS

- a. A pilot will be assigned the collateral duty of Scheduling Officer. The Scheduling Officer will:
 - (1). Schedule all flights, considering research priority, and aircrew availability.
 - (2). Monitor flight time and inspection requirements on proficiency and support aircraft, and adjust flight schedules to integrate flight and maintenance requirements.
 - (3). Notify aircraft maintenance operations concerning aircraft requests, including time of flight, fuel service required, and type of mission.
 - (4). Keep the Chief Pilot briefed and current on daily schedules of research support, maintenance, and proficiency flights.
 - (5). Work with and assist the Flight Scheduling Officer to assure that all airspace, range, and frequency requirements are scheduled with AFFTC.
- b. The exception to these functions is for ER-2 operations. For ER-2 flights, the ER-2 aircraft monitor or their designated representative will schedule all ER-2 flights.
- c. Dryden Flight Operations will maintain logs and other appropriate documentation to record pilot and aircraft flight times. Aircraft flight time will be coded by mission type:
 - X-1 Research test flights
 - a. Use X-1C to indicate a captive carry mission in the B-52
 - X-2 Research support flights, such as:
 - a. Safety or Photo chase support
 - b. Research mission training
 - c. Instrumentation or data system checkout
 - d. Range operations support
 - X-3 Maintenance functional check flights
 - X-4 General proficiency or program support flights
 - X-5 Mission Management flights
 - X-6 Airborne Science research flights

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7. FLIGHT CLEARANCES

- a. The pilot in command of a Dryden aircraft will ensure that a flight plan is prepared prior to every flight. The form used will be one of the following:
 - (1) Local research and research support flights - the Research Flight Request ([DFRC Form 110](#))
 - (2) Local flights in VFR conditions - DFRC Local VFR Flight Plan (Flight Operations Form 22)
 - (3) Local flights in IFR conditions - Military Flight Plan (DD Form 175)
 - (4) Departure from military airfields - Military Flight Plan (DD Form 175) or DOD International Flight Plan (DD Form 1801)
 - (5) Departure from civil airfields - Flight Plan (FAA 7233-1) or DOD International Flight Plan (DD Form 1801)
 - (6) ER-2 local flights in VFR conditions - ER-2 Flight Authorization ([DFRC Form Y-001](#)).
- b. All research, test support, and proficiency flights conducted within the R-2508 complex or originating and terminating at Edwards AFB require an operations number from the Air Force Flight Test Center scheduling office. Cross country and round-robin proficiency flights conducted using a DD Form 175, DD Form 1801, or FAA 7233-1 do not require an operations number, however an operations number may be required if a significant portion of the flight will be conducted within the R2508 complex.

8. FLIGHT PLANNING FACILITIES

To meet the responsibility for the flight operations at Dryden, the Flight Operations Directorate directs and coordinates a flight planning operation with facilities and information sufficient to provide for complete self-briefing and preflight planning by all Dryden and visiting pilots. This includes:

- a. A flight planning room with desks and chairs; storage for information files, maps, and charts required by pilots; and wall space for the display of aeronautical information.
- b. Pilot information files containing applicable NASA and Dryden flying policies, procedures, instructions, and regulations; applicable Department of Defense and other federal agency regulations on operations, flying and flight safety; flight manuals; local Air Force Base flight operations regulations and other pertinent data relating to Dryden flight programs, projects and mission.
- c. A Flight Crew Information File (FCIF) for ensuring that all Dryden primary aircrew are familiar with the latest information applicable to their assigned

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responsibilities, including a procedure to ensure that all primary aircrew review all changes, deletions, additions, and new material in the pilot information files. FCIF cards will be maintained on all primary aircrew assigned to support Dryden flight research projects.

- d. Displays of flight information maps and local flight planning maps, showing standard routes, control zones, and airways, and giving details of local danger areas and flying areas. Also, a display of the Edwards Air Force Base airfield plan map showing runways, taxiways, runway and taxiway dimensions, runway gradient, field elevation, overruns, adjacent terrain features, and airfield hazards.

9. AIRCREW QUALIFICATIONS AND CURRENCY RECORDS

To ensure that all Dryden aircrew maintain the high level of qualifications and currency standards required by the Dryden Flight Research Center, the Directorate, Flight Operations, will maintain a system of records, notices, and reports covering each individual aircrew in the organization. This system will include:

- a. A daily log showing the flights flown by individual pilots, flight time, type of flight, and type of aircraft or research vehicle involved.
- b. A monthly flight report for each primary aircrew showing status with respect to training and currency requirements.
- c. A record file (flight jacket) for each primary aircrew to include: Emergency notification data, initial qualification records, recurrency certifications, formal flight schooling, recurring simulation and emergency procedure training as determined by the aircraft monitor (Chapter 3, paragraph 5), and other familiarization or training records.
- d. The Life Support Section will keep current records for primary and attached aircrew to include (whenever applicable):
 - (1) Ejection/egress training
 - (2) Physiological training
 - (3) Medical clearance
 - (4) Special training e.g. water and land survival courses and training.
- e. ER-2 Physiological and Ejection Seat training records and copies of ER-2 Pilot Medical Clearances will be maintained by the ER-2 aircraft monitor.
- f. A member of the Flight Crew Branch will be designated as the training officer and be responsible to monitor flight jackets and life support training to insure that training is current for all assigned aircrew.

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10. FORMATION FLIGHTS

Formation flights of Dryden Flight Research Center aircraft must take place only by prior arrangements between the pilots of the aircraft involved. Normally, such arrangements must be made prior to takeoff of the aircraft involved; however, arrangements may be made in flight by radio when the individual pilots involved determine that a formation flight is appropriate for official flight test or training purposes. Formation takeoffs and landings are authorized for sections of not more than two aircraft. When an emergency or special circumstance exists or for the protection of lives, a deviation from the prior arrangement is permitted with the following precaution: the decision to operate near another aircraft in flight must be carefully weighed, considering the capabilities of the aircraft and understanding the intentions of the crews involved. In no case should the action increase the overall hazard.

11. HIGH ALTITUDE FLYING

Dryden Flight Research Center aircraft will not operate above 50,000 feet unless the pilot is properly protected by an approved full or partial pressure suit or other appropriate life support equipment.

12. BASIC FIGHTER MANEUVER (BFM) FLIGHTS

- a. All BFM flight will include appropriate briefings using the Dryden briefing guide and rules of engagement located in the Flight Planning Room.
- b. Whenever possible these briefings should be conducted face-to-face.
- c. BFM against dissimilar adversaries will only be flown by those pilots specifically designated in their flight jacket by the Chief, Flight Crew Branch.

13. T-34 SPIN TRAINING

Normal erect spins will be flown only with two pilot crewmembers in the aircraft. Control release and progressive spins may be demonstrated or practiced if one crewmember is designated a T-34C instructor pilot. Normal erect spins may be demonstrated to a non-pilot crewmember by an instructor pilot. No other spin modes will be flown. Spin entry will be at or above 9000 ft. AGL. If the aircraft is out of control passing 5000 ft. AGL, bailout will be initiated. All spin maneuvers to be flown will be briefed, indicated on the local flight plan form, and initialed by the Chief, Flight Crew Branch or his/her designated representative prior to the flight.

14. AIRCRAFT ACCEPTANCE AND FORMS

Each aircraft will have a Dryden Aircraft Maintenance Record noting the readiness of the aircraft, including status and fuel service. The form will be completed and signed by the aircraft crew chief and readied for presentation to the pilot scheduled. The pilot will accept the aircraft as ready by inspecting the form and signing in the appropriate slot. The

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pilot may sign off an open non-grounding maintenance item. An open grounding maintenance item must be downgraded to an open non-grounding item by approval of the Director for Flight Operations, or his/her representative, before flight. An open grounding maintenance item for the ER-2 can be downgraded to an open non-grounding item by the ER-2 Maintenance Manager or his/her designated representative.

15. PRIMARY AIRCREW DUTY TIME

Maximum primary aircrew (pilot, flight engineer, navigator) duty times are shown below. Crew duty time is the total time a crew is on duty before the final termination of a flight. Crew duty time accrues consecutively and begins when a crew reports to a designated place of duty to begin preparation for a flight and ends when the aircraft is parked and shutdown. Following completion of a duty day, a crewmember must have at least twelve hours off duty prior to being a required person for a subsequent flight. These requirements can be waived by the Director for Flight Operations or a designated representative on an individual basis.

- a Single piloted aircraft or dual controlled aircraft with one pilot - 12 hours
- b Dual control aircraft with two pilots on board - 14 hours
- c Two pilot required aircraft with three pilots on board - 16 hours
 - 1) DC-8 – An additional flight engineer is required onboard to extend duty time beyond 14 hours.
- d ER-2 – 12 hours, with 6.5 hr. normal flight duration. Flight duration can be extended to 8.0 hr. with concurrence of the Chief, Flight Crew Branch; duration above 8.0 hr. can be extended with concurrence of the Director for Flight Operations.

16. WEATHER MINIMUMS

- a Weather criteria for IFR operations are shown in Table 2.
- b Pilots will not make practice approaches when the reported weather is below published minimums for the approach being flown.
- c In certain overseas cases with no alternate airport available, two hours holding fuel may be used in lieu of an alternate.

WEATHER CRITERIA FOR IFR FLIGHT (TABLE 2)

Departure	Arrival	
Existing weather at or above published minimums for any approach compatible with aircraft equipment.	Forecast Ceiling - Visibility Requirements for ETA 1 hour	
OTHERWISE		
Can depart with a minimum of 1,600 feet RVR for the runway in use. If RVR not available, must have at least 1/4-mile prevailing visibility. In either case, departure alternate must be designated on flight plan. There is no ceiling requirement for takeoff.	<u>Destination</u>	<u>Destination alternate</u>
Departure alternate has same weather requirements as destination alternate.	Published minimums.	(Required if destination weather within 1 hour of planned arrival time is less than 3000 feet ceiling and 3 miles visibility or published approach visibility minimums plus 2 miles (whichever is greater)). Greater of 1000 feet ceiling or 500 feet above the lowest published approach MDA/DH minimums and 2 miles visibility or published approach visibility minimums plus 1 mile.

17. FUEL MINIMUMS

- a. Cross Country - sufficient fuel to reach the destination initial approach fix, proceed to an alternate, if required by weather conditions, and complete an approach and landing, plus 10% or 20 minutes low altitude loiter, whichever is greater. Compute fuel consumption for loiter based on maximum endurance operation at 10,000 feet. If, under marginal weather conditions, an approach is flown at the original destination, fuel must be sufficient to complete a missed approach, proceed to an alternate, and complete an approach and landing with the above fuel reserve.
- b. Local operations, support aircraft (F-18, F-15)
 - (1) Minimum fuel - 2000 pounds
 - (2) Emergency fuel - 1500 pounds

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- c. Other research, airborne science and support aircraft - as determined and briefed by the project pilot (research) or aircraft monitor (support).
- d. ER-2 and DC-8 fuel loads with sufficient fuel to take full advantage of windows of opportunity for completion of science requirements. Minimum fuel requirements are:
 - (1) For VFR at landing site – land with at least 45 minutes of fuel.
 - (2) For IFR at landing site – plan enough fuel to fly to destination, then proceed to the alternate, fly approach and land with 45 minutes of fuel remaining.
- e. Bingo and landing fuels should be planned to allow landing in normal traffic sequence prior to reaching the minimum fuels noted above. When lakebed runways are not available at Edwards AFB, bingo and landing fuels will be adjusted to allow for runway 22-04 closures that would require landing at an alternate landing site prior to reaching the minimum fuels noted above.

18. FUNCTIONAL CHECK FLIGHTS

- a. Functional check flights are accomplished when significant maintenance or modifications have been performed to an aircraft involving flight critical systems such as engines, electrical systems, hydraulics, flight controls, pilot static systems, environmental systems (including pressurization), and other essential systems for safe operation, or to check aircraft characteristics in critical flight regimes, such as stalls. Functional check flights are normally not required for instrumentation or experiment system checkout if the integrity of flight critical systems are not affected. Flights dedicated to instrumentation or experiment system checkout are accomplished as mission support flights.
- b. Functional check flights on support aircraft will normally be conducted in accordance with applicable NATOPS, USAF Technical Orders, or a Production Flight Procedures Manual (PFPM). The Director, Aircraft Operations Directorate, or his/her designated representative, may approve exceptions to this general guidance.
- c. The following considerations will be used to determine if a functional check flight is required for research aircraft (including airborne science aircraft):
 - (1). Applicable NATOPS, USAF Technical Order, or Production Flight Procedures Manual requirements.
 - (2). Length of time since the aircraft last flew.
 - (3). Types of modifications made to the aircraft since it last flew.
 - (4). Amount and type of maintenance performed on the aircraft since it last flew.

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- d. Functional check flights on research aircraft will be conducted at the discretion of the project manager, operations engineer, and project pilot. The Director, Aircraft Operations Directorate, or his/her designated representative, may also direct functional check flights.
- e. Functional check flights on research aircraft may be full or partial profiles.
 - (1). Full profiles will normally be flown if the aircraft has not flown for an extended period of time or if extensive modifications or maintenance has been accomplished since it last flew.
 - (2). Partial profiles may be flown to check specific aircraft systems affected by maintenance or modifications.
- f. Functional check flight procedures for each research aircraft will be reviewed in light of aircraft limitations and modifications. Where appropriate, modified functional check flight procedures will be written. These modified procedures will be documented in the aircraft flight manual, in a dedicated functional check flight checklist, or in the aircraft fact sheet.
- g. Specific functional check flight procedures to be followed for a research aircraft will be briefed at the appropriate technical briefing (Tech Brief or Mini-Tech) prior to flight to inform management of specific maneuvers to be flown.
- h. Functional check flight maneuvers will be documented in either a dedicated functional check flight checklist or on mission test cards.
- i. When a partial functional check flight profile is flown on a research aircraft, it may be combined with a test mission. The mission may integrate test maneuvers and functional check requirements in any manner to facilitate mission accomplishment with the proviso that test maneuvers must not be accomplished until after all applicable functional checks are completed. Generally this will require that functional maneuvers must be flown at the beginning of the flight.
- j. For functional check flights for all aircraft, only essential crew will be utilized. The crew size and positions to be occupied during a functional check flight will be determined by the pilot-in-command based on the requirements of the flight. All crewmembers will be fully qualified for the position occupied. Normal functional check flight crew complement, unless otherwise authorized by the Chief, Flight Crew Branch or the Director for Flight Operations, or their designated representatives, will generally be:
 - (1). Fighter: 1 pilot
 - (2). T-34: 1 pilot
 - (3). B-52: 4 (2 pilots, 1 crew chief, 1 launch panel operator)
 - (4). Learjet: 2 pilots
 - (5). King Air: 1 pilot (2 preferred)
 - (6). DC-8: 3 (2 pilots, 1 flight engineer)

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19. CREW BRIEFINGS

- a. Flight planning is an essential part of the process for conducting flights in a safe and efficient manner. All flights conducted in DFRC aircraft will be planned and briefed appropriately to insure thorough preparation. Flights involving more than one aircraft operating in coordination with each other (formation flight, air combat maneuvering, etc.) require a briefing between the pilots to insure that all maneuvers to be flown are coordinated and all contingencies considered. Flights involving aerial refueling require coordination with the tanker aircraft and a review of air refueling procedures.
- b. The Crew Briefing is an essential part of the process for conducting research flights in a safe and efficient manner. The briefing is conducted no more than 1 day prior to flight. The crew briefing is normally the last formal briefing and presentation prior to the actual research flight. This briefing is normally conducted by the Pilot in Command flying the mission. He/she can be assisted by project personnel, flight test engineer, or others involved in the particular mission. If the flight slips more than 24 hours, a new crew briefing will be scheduled. The express intent is to cover all operational aspects of the mission and to promote full understanding among the participants. Absentees must be briefed prior to the actual flight.
- c. The following personnel shall attend research flight crew briefings, as appropriate for the mission requirements:
 - Aircrew members including chase support pilots
 - Senior Flight Operations representative
 - Operations engineer
 - Weather representative, if required
 - Control room subsystem monitors
 - Appropriate systems engineers
 - Safety representative
 - Project scientists
 - Project office representative
- d. Briefing formats for different project flights may vary but should cover the following areas:
 - Technical briefing follow up/ open items
 - Weather
 - Test plan/flight profile
 - Test cards/chase requirements
 - Mission rules/limitations/Go and No-Go Criteria
 - Aircraft status
 - Crew coordination items
 - Emergency procedures
 - Bingo and landing fuel

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20. ABNORMAL AIRCRAFT OPERATIONS

- a. The practice of inflight emergency procedures, such as simulated single engine landings, actual engine shutdowns and restarts, etc., may be accomplished for training or evaluation flights with prior preflight planning. Practice emergency procedures are prohibited when carrying attached aircrew (except FTEs or essential aircrew), passengers, research engineers/scientists (qualified primary aircrew may occupy a passenger seat if aboard for training).
- b. Aircraft operations without all normal flight critical systems fully functional, as defined by the aircraft flight manual, such as three-engine ferry of a four engine aircraft, are prohibited without approval of the Director for Flight Operations. If approved, abnormal operations will be conducted with minimal required crew for the intended operation, as described in the Functional Check Flight section. Abnormal flight operations will not be conducted while carrying passengers, nonqualified primary aircrew, attached aircrew, or research engineers/scientists (qualified aircrew may occupy a passenger seat if extra pilots are aboard for mission accomplishment).

21. FLIGHT PUBLICATIONS FOR RESEARCH AIRCRAFT

- a. Research aircraft are frequently highly modified to accomplish test objectives. It is critical to document those modifications that affect the operation of the aircraft, including normal and emergency procedures, instrumentation system operating procedures, and flight limitations. This may be accomplished through fact sheets posted in the flight manual (for minor or temporary changes), flight manual supplements (for more extensive changes), or a complete re-write of the flight manual (for major modifications). Normal and emergency procedure checklists should be modified or re-written so that pilot procedures, as applied to the particular test aircraft, are clear to the pilot and supporting test team in the control room. It is generally undesirable to require reference to multiple flight manuals during an emergency. Therefore, whenever practical, a consolidated single document should be created for each test aircraft. Project pilots should review and sign fact sheets, locally generated flight manuals and supplements, and checklists to indicate they have been reviewed and approved for use. Mission rules or guidelines may be written by research projects that further define how research aircraft are operated during research test missions. Project pilots should review and sign mission rules/ guidelines. Fact sheets, flight manual supplements, modified checklists, and mission rules/guidelines should be posted in the pilot's office with the master flight manual for the aircraft.
- b. Certain research aircraft flight manuals are no longer updated by the manufacturer or military user because the aircraft is no longer used in the active inventory. In these cases, flight manuals for newer models of the aircraft should be maintained and referenced to determine if procedures for the research aircraft should be revised.

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22. WEIGHT AND BALANCE FORMS

A copy of current aircraft weight and balance forms (USAF Form F or equivalent) for all aircraft operated at the Dryden Flight Research Center will be maintained in the pilot's office at the operations desk with the aircraft flight manuals or in Code Y for the DC-8 and ER-2 aircraft. Additionally, a copy of the weight and balance form for each normal (non-test) configuration likely to be flown will be maintained for each fighter aircraft that can be configured with external stores.

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CHAPTER 2: JOINT FLIGHT PROGRAMS

1. INTER-AGENCY INTERESTS

The Dryden Flight Research Center as a field installation of NASA may have an interest in research and test programs of Department of Defense agencies and other Government agencies associated with aeronautical and aerospace research programs. Upon request, Dryden also conducts research on specific problems for the benefit of these other agencies. Consequently, occasions will arise when it is in the interest of NASA and the Dryden Flight Research Center mission to participate in joint flight programs with these agencies or in flight operations conducted by them.

2. AGREEMENTS AND PROGRAM APPROVAL

Decisions to participate in joint programs to support a research flight operation of another federal agency will be based on official agreements established and approved between NASA and other agencies.

3. APPROVAL TO FLY IN NON-DRYDEN CONTROLLED AIRCRAFT

a. Approval and waivers for aircrew flying on aircraft operated by other government agencies.

- (1). The Director for Flight Operations will grant approval of NASA aircrew to participate in a flight operation of another agency, in keeping with officially established agreements as set forth in Paragraph 2 above. Such approval will require compliance with all aircrew qualification requirements established by Dryden Flight Research Center policies and the specific flight programs involved. A waiver of any established qualification requirement for a Dryden Flight Research Center NASA aircrew will require approval of the Director for Flight Operations.
- (2). For flights on aircraft operated by other government agencies without official agreements, NASA Dryden aircrew must secure the approval of the Chief, Flight Crew Branch and the Director for Flight Operations, to fly as a crewmember or test observer in a government aircraft as a NASA employee on official duty status. Written approval using the [DFRC Form 176](#) is required.

b. Approval and waivers for aircrew flying on non-government aircraft.

- (1). NASA Dryden aircrew must secure the approval of the Chief, Flight Crew Branch and the Director for Flight Operations, to fly as a crewmember or test observer in a non-government aircraft as a NASA employee on official duty status. Written approval using the DFRC Form 176 is required.
- (2). The Director for Flight Operations shall assure that reasonable flight safety standards will be in effect and issue a memo to the individual and to their Directorate Chief so stating.

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(3). Exceptions:

- a. Aircraft certified for, and being operated as a revenue aircraft. (cargo or passenger)
- b. Aircraft flown while a member of the reserves or National Guard.
- c. Aircraft identified in a formal Center-level MOU/MOA that allows NASA aircrew participation.

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CHAPTER 3: AIRCREW QUALIFICATIONS AND CHECKOUT REQUIREMENTS

1. POLICY

- a. Research test pilots and other aircrew at the Dryden Flight Research Center are engaged in aeronautical research flight programs that involve the application of advanced and unconventional flying techniques. It is Dryden policy to ensure that each of these flying personnel is thoroughly qualified as a test pilot to operate aircraft and experimental aerospace vehicles within limitations imposed on them individually; and that a systematic program of pilot checkout, training, certification, and currency is maintained at all times.
- b. Airborne Science aircrews based at Dryden accomplish airborne science data collection by conducting worldwide flight operations. It is Dryden policy that each aircrew member is fully qualified to perform their duties safely and effectively in the conduct of above mentioned flights, and that a systematic program of checkout, certification, training and currency is maintained at all times.
- c. The Chief, Flight Crew Branch and the Director for Flight Operations shall approve a program of training and checkout for non Dryden pilots that operate Dryden research or support aircraft.

2. RESEARCH TEST PILOT QUALIFICATIONS

The basic education requirements is successful completion of a standard professional curriculum in an accredited college or university leading to a bachelor's degree or higher with major study in an appropriate field of engineering, physical science, life science, or mathematics. Supplemental course work may be required. In addition, candidates must have a current FAA commercial pilot license with instrument rating or a pilot and instrument rating from the armed services. Also required is a minimum of 1,500 hours of pilot in command (or first pilot) flight time which included at least 500 hours of jet aircraft having at least 3000 pounds of thrust per engine; plus one year of research piloting experience equivalent to the next lower grade in the Federal service; or three (3) years of progressive research piloting experience; one year of which was equivalent to next lower grade. Selected candidates must also meet the security requirements of the position.

3. DC-8 RESEARCH PILOT QUALIFICATIONS

The basic education requirement is successful completion of a standard professional curriculum in an accredited college or university leading to a bachelor's degree or higher. In addition, candidates must possess an FAA commercial pilots license with instrument rating or possess a pilot and instrument rating from the armed services. Also required is a minimum of 500 hours as the pilot in command in a transport or bomber class aircraft with a gross weight of at least 100,000 pounds. Selected candidates must also meet the security requirements of the position.

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4. ER-2 RESEARCH PILOT QUALIFICATIONS

The basic education requirement is successful completion of a standard professional curriculum in an accredited college or university leading to a bachelor's degree or higher. In addition, candidates must possess an FAA commercial pilots license with instrument rating or possess a pilot and instrument rating from the armed services. As a general policy, pilots should have at least a 1000 hours in the U-2 and have been a current U-2 pilot within the past year to be qualified to begin duty as a NASA ER-2 pilot. Selected candidates must also meet the security requirements of the position.

5. PRIMARY AIRCREW TRAINING AND CHECKOUT

- a. Individual research test pilots are normally involved in flying several test aircraft and experimental aerospace vehicles as well as various support aircraft. A research test pilot assigned to a flight project must have established proficiency in the aircraft type or a vehicle of a similar nature. In the event the pilot is not current, he/she will receive proficiency training or requalification under direction of a current pilot. The exact nature of the training will vary with the nature of the aircraft involved, but will normally include:
 - (1) Ground training (including aircraft and cockpit checkouts), handbook study (when available), simulator emergency procedure training (if available), and the performance of an operational examination (open book).
 - (2) Flight checkouts, which may include dual flights with a checkout pilot, or solo flights monitored by a checkout pilot in flight.
 - (3) Solo flights in which a prescribed number of flights in a given time are performed to complete initial checkout, followed by support flights and test flights of a limited nature.
- b. When available, military and/or civilian training schools will be used to provide primary aircrew with ground school, simulator, and/or flight training for aircraft checkout and familiarization.
- c. The checkout and training cited in 4a and 4b above are applicable to prototype and other aircraft that have been operated by other organizations prior to the Dryden pilots' checkout. In the case of new and experimental or research aircraft for which no formal schools are available, the services of the designers and the manufacturer's best qualified personnel will be utilized to brief and familiarize the Dryden pilots with the aircraft and aircraft systems. In addition, existing simulators and aircraft of a similar nature will be used to give the pilot as much preparation as possible for the first flight in a research vehicle.

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- d. Because of the unique nature of each research program, the precise number of simulator hours and the number of flights in similar type aircraft will vary from program to program. In each case the Director for Flight Operations, the Chief, Flight Crew Branch, and the assigned project pilot(s) or aircraft monitor are responsible for determining the exact amount and type of preflight training that is essential to meet the research flight requirements. Required training, including special training such as air refueling, spin or departure training, etc., is documented in the training folder for each aircraft type and maintained in the Flight Crew Branch.
- e. All activities accomplished in support of initial checkout in an aircraft will be documented on the Aircrew Initial Qualification Record form and kept on file in his/her flight records.

6. PHOTO AND SAFETY CHASE CHECKOUT

- a. Research test pilots who are graduates of a recognized test pilot school will generally have received training and practical experience during their test career in photo and safety chase procedures. Generally, no additional training will be required. Additional training may be required to meet special requirements or for breadth of experience by the Chief, Flight Crew Branch, prior to being cleared to chase NASA Dryden research test missions.
- b. Research pilots who are not graduates of a recognized test pilot school and who have not received training or practical experience in photo and safety chase procedures require a formal checkout prior to being cleared for chase duties. Individuals will be approved for such training by the Chief, Flight Crew Branch. The checkout ground briefings and flight maneuvers are documented in a special qualifications training folder maintained in the Flight Crew Branch. Training is documented on the Aircrew Initial Qualification form and kept on file in the pilot's flight record.

7. ATTACHED AIRCREW TRAINING AND CHECKOUT

- a. Attached aircrew using the DFRC Form 176 will be assigned a training category by the Chief, Flight Crew Branch. The categories and training are:

A---Long Term (Not to exceed one year)
(Ejection seat aircraft F18/F15/F16/B52/ER2 and Non Ejection Seat aircraft T34/DC8).

Annual Physical
Altitude Chamber
Water Survival

Egress in assigned aircraft
Equipment Issue
Land Survival

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B---Learjet/ King Air passenger type aircraft/ DC8 Non-Aircrew

Egress

Other training as directed by the Chief Pilot

C---Short term or one time flights in all other DFRC aircraft.

Medical clearance by the Flight Surgeon

Temporary equipment issue through Life support

Egress

Other training as directed by the Chief Pilot

8. PERSONS FLYING IN PASSENGER STATUS

Persons not obtaining flight approval using a DFRC Form 176, such as DC-8 experimenters and maintenance personnel or project persons or maintenance personnel in passenger status on the King Air or Learjet, obtain aircraft egress training as documented on the passenger manifest.

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CHAPTER 4: AIRCREW READINESS AND CURRENCY

1. AUTHORITY TO ESTABLISH CURRENCY REQUIREMENTS

The Director for Flight Operations, has authority to establish and approve all flight currency requirements for all aircrew assigned to Dryden. This includes general and long term flight currency requirements and specific requirements established for particular flight research programs and aircraft.

2. WAIVER OF REQUIREMENTS

A waiver of currency requirements may be granted by the Director for Flight Operations, in connection with a Dryden Flight Research Center flight operation. Such waivers will be based on the recommendation of the Chief, Flight Crew Branch and in consideration of the nature of flight operations, the particular vehicle involved, and the overall qualifications of the individual aircrew concerned.

3. GENERAL PILOT CURRENCY REQUIREMENTS

Once a pilot has been checked out in an aircraft, he/she must maintain his/her currency by a designated minimum number of flights in a given period of time. Currency will be monitored by Flight Operations Scheduling. In the case of experimental aircraft that are unavailable for long periods of time, aircraft similar to the experimental aircraft will be utilized for readiness training. General currency requirements for support and Airborne Science aircraft are as follows:

- a. One flight and one landing each 45 days.
- b. After 45 days, a review of normal and emergency procedures will be accomplished, and annotated by the pilot on the flight plan form.
- c. After 90 days, a recurrency flight will be accomplished, monitored by an instructor pilot
- d. Additional ER-2 pilot currency requirements.
 - (1) Minimum of one Simulated Flameout (SFO) approach and one no-flap landing each 90 days.
 - (2) Minimum of six instrument approaches within the last six months.
 - (3) One sortie within two weeks prior to any deployment identified as high risk in the deployment's Operational Readiness Review.
 - (4) If noncurrent for SFOs, instrument approaches or no-flap landings, the pilot will review flight manual procedures for the non-current maneuver and accomplish the maneuver on the next flight.

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- (5) The ER-2 aircraft monitor may authorize additional ER-2 proficiency flights if required to maintain pilot proficiency or to accommodate proficiency requirements for unique ER-2 operations.

4. ANNUAL FLIGHT PROFICIENCY REQUIREMENTS

- a. Overall annual requirements for Dryden research pilots (including all research test pilots) are as follows:
 - (1) Total minimum annual proficiency level for pilots is mandated based on a minimum number of sorties or a minimum number of flight hours (either criterion may be used). The total minimum number if sorties is 120 sorties per year. The total minimum flight time per year is 200 hours. The annual flight time requirement may be prorated based on leave, illness, or travel.
 - (2) The minimum semiannual proficiency level for pilots is mandated based on a minimum number of sorties or a minimum number of flight hours (either criterion may be used). The minimum number of sorties is 60 sorties per six months is 80 hours. Pilots qualified in single-seat type performance aircraft should obtain at least one night sortie per half in high performance aircraft.
 - (3). Minimum night flying time per year - 5 hours (2 hours per six months). Pilots qualified in single seat type high performance aircraft should obtain at least one night sortie per half in high performance aircraft.
 - (4) Minimum instrument flight time per year - 20 hours per year of which 10 hours may be obtained by simulator operations (10 hours per six months).
 - (5) Minimum number of precision approaches per six months – 3
 - (6) Minimum number of non-precision approaches per six months - 3.
 - (7) The annual flight proficiency requirement for ER-2 pilots is 30 sorties per year (12 sorties per six months) in the ER-2.
 - (8) There is no established minimum number of sorties or hours in any particular aircraft type, except as noted above.
- c. Dryden Research Pilots in management positions, other Dryden research pilots so designated in writing by the Chief of the Flight Crew Branch, other Dryden aircrew assigned to piloting duties on a part-time basis, and NASA Pilots not assigned to Dryden but who are authorized by the Chief of the Flight Crew Branch to fly Dryden aircraft must meet the requirements of Paragraph 3 above. For these pilots, the requirements of Paragraph 4 are modified as follows:

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- (1) Minimum number of sorties is 60 sorties per year or the minimum flight time per year is 100 hours (either criterion may be used). The annual flight time requirement may be prorated based on leave, illness, or travel.
 - (2) The minimum number of sorties is 30 per six months or the minimum flight time in previous six months is 40 hours (either criterion may be used). Pilots qualified in single seat type high performance aircraft should obtain at least 30 sorties per half in a high performance aircraft
 - (3) All other requirements of Paragraph 4 - No change.
- c. The Director of Flight Operations may designate certain pilots as “Day, VFR only” or “Day only”. These pilots will meet the requirements of paragraphs 3 and 4, above, except for the night and instrument time requirements are waived, as appropriate. These designations will be documented on the initial checkout form for the aircraft maintained in the flight jacket. Unless otherwise documented, the pilot is considered fully qualified in the aircraft.

5. RECURRENT TRAINING REQUIREMENTS FOR PILOTS

- a. An annual instrument review and refresher class will be completed every 12 months by each pilot to ensure that he/she is familiar with the latest rules and regulations concerning instrument flight. A locally prepared instrument examination may be taken in lieu of attendance at a formal instrument refresher course (either military or civilian).
- b. Every 12 months each pilot will complete recurring training for each type test, support or airborne science aircraft they are qualified in. Recurring training will be specified by each aircraft monitor to include:
 - (1). An aircraft proficiency review flight to demonstrate proficiency in normal, instrument (non-test aircraft only), and emergency aircraft flight procedures. A formal check ride is required only in the pilot's primary proficiency aircraft.
 - (2). An emergency procedures review
 - (3). An open book examination

These activities will be recorded in the pilot's flight record file. Any refresher training accomplished at an approved commercial training establishment or through the military (including USAF or USN instrument refresher training) may be utilized to fulfill the above requirements.

- d. Each pilot will complete a review of ejection seat and egress procedures every 12 months for each of the support aircraft flown under the guidance of the qualified Life Support Section (OFL) personnel. Where possible this training will include "hanging harness" training. The Life Support Section will keep training records. The ER-2 aircraft monitor will maintain ER-2 records.

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- e. For research test aircraft, the project pilot is responsible for coordinating appropriate training for all pilots and crewmembers with Life Support at times appropriate to the availability and flight activity of the aircraft, but at a minimum of once annually. The Life Support Section will keep the records of the ejection/egress training.
- f. For non ejection seat aircraft, the aircraft monitor or life support may provide egress training.
- g. If a life support technician is not available in a timely manner to provide egress training for any aircraft, a qualified pilot for that aircraft may provide egress training and is responsible to insure the training is properly documented in the Life Support Section. However, to the maximum extent possible, Life Support will provide egress training for ejection seat aircraft.

6. FLIGHT CURRENCY REQUIREMENTS FOR ATTACHED AIRCREW

- a. Persons assigned to long term flight status as either flight test engineers (FTE) or aerial photographers (either still or video) in high performance aircraft must fly at least once per 60 days in either a high performance project aircraft, a support F-18, or the T-34.
- b. Persons assigned to long term flight status to support projects in other than high performance aircraft (transport or bomber class aircraft, business class aircraft, light aircraft, etc.) do not have a flight currency requirement. The project pilots will insure that individuals assigned to these aircraft are properly trained prior to flight to accomplish the assigned mission.
- c. The Pilot in Command is responsible to ensure that crewmembers/passengers meet the applicable training requirements. A waiver of requirements may be granted by the Director for Flight Operations, in connection with a Dryden Flight Research Center flight operation. Such waivers will be based on the recommendation of the Chief, Flight Crew Branch and in consideration of the nature of flight operations and the particular vehicle involved.

7. PILOT DESIGNATIONS

Pilot designations below will be documented in pilot's flight record file.

- a. Instructor Pilot: The Chief, Flight Crew Branch will designate those pilots with appropriate qualifications and experience as Instructor Pilot (IP) for each aircraft type, research and support. In addition to aircraft instruction, an IP will be required for any flight conducted in dual controlled aircraft when the primary seat is occupied by a pilot unqualified in that type.

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- b. Evaluator Pilot (EP): The Chief, Flight Crew Branch will designate flight examiners who can evaluate annual proficiency and initial qualification check flights as Evaluator Pilots.
- c. Pilot: The designation of Pilot (P) signifies fully qualified in that aircraft.
- d. Copilot: The designation of Copilot (CP) signifies qualified in a multipilot aircraft but cannot act as Pilot in Command of that aircraft.

8. AIRCRAFT MONITORS

- a. A highly qualified Instructor Pilot, Flight Engineer (if applicable) and Navigator (if applicable) will be identified by the Chief, Flight Crew Branch as the aircraft type monitor for each aircraft.
- b. The monitors are required to keep current on the latest information for their aircraft and inform the other pilots accordingly. They will also conduct systems and emergency procedures review seminars at the safety meetings. The monitors are responsible for creating, updating, and administering the aircrew training syllabus for each aircraft

9. SPECIFIC FLIGHT PROJECT REQUIREMENTS

- a. Pilot readiness and currency requirements for specific flight research projects and experimental aircraft are established by the Director for Flight Operations, the Chief of the Flight Crew Branch, or the project pilot, on an individual basis.
- b. If the complexity of the research aircraft does not require a special operations plan, the general flying requirements for proficiency will prevail.

10. GROUNDING OF AIRCREW

- a. Mandatory temporary grounding of aircrew will occur for the following reasons until the specified corrective action is completed:
 - (1). Flight physical overdue. Aircrew must complete a flight physical to resume flight duties.
 - (2). Physiological training overdue. Aircrew must complete physiological training to resume flight duties, if physiological training is required.
 - (3). Egress and ejection seat training overdue. Aircrew must complete egress and ejection seat training to resume flight duties in the aircraft for which training is required.
 - (4). Check ride or review flight overdue. Pilot is restricted from solo operations (only pilot aboard the aircraft) in the aircraft type until the check ride or review flight is completed. In multi-place aircraft, the pilot is restricted from performing pilot-in-command duties until the check ride or review flight is completed. In the ER-2, the pilot must receive a check ride at the next opportunity. The Chief of the Flight Crew Branch may use discretion and

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waive this requirement, in writing, if an aircraft is unavailable or for other unforeseen circumstances, but the check ride or review flight must be completed expeditiously.

- (5). No other overdue training requires a mandatory grounding, but must be waived in writing by the Chief of the Flight Crew Branch and completed expeditiously.
 - (6). Flight physicals and training are not considered overdue until the first day of the month following the month in which the physical or training expires.
- b. The Chief of the Flight Crew Branch or the Director for Flight Operations have the authority and responsibility to temporarily ground aircrew, in writing, for a period of up to 30 days for flight discipline or flight safety violations, or for other reasons as deemed appropriate. He/she also has the authority and responsibility to recommend permanent grounding of aircrew.
 - c. Upon concurrence of the next level supervisor on the recommended permanent grounding, the Center Director shall be notified immediately so that he/she may appoint a Flight Status Review Board. The functions of this board are covered in Chapter 4, Section 11 of this manual.
 - d. In all cases of a permanent grounding of flight crew, the cognizant supervisor shall, within 30 calendar days of the action:
 - (1). Conduct a performance appraisal review with the grounded flight crew that shall include a discussion of reasons for the grounding action and annotate the performance appraisal to reflect the situation, and
 - (2). Coordinate with management and the Dryden Human Resources Branch to effect the timely and appropriate reassignment of position duties of the affected flight crew.

11. FLIGHT STATUS REVIEW BOARD

- a. Whenever a Flight Crew is removed from flight status by the authority vested in relevant supervisors, that situation will be reviewed by a third party board. This board will be appointed by the Center Director and shall be disbanded after presenting their Findings and Recommendations to the appropriate members of management. The grounded flight crew may waive his/her right to this review in writing, at any time during the process, and in such cases the Board will terminate at that time.
- b. The Board's scope includes all elements pertinent to the grounding that are necessary to arrive at their conclusions and recommendations. However, their scope does not include personnel assignment options beyond the flight status issue. The Board should feel free to call upon any Center resources required in the course of their review.

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- c. All testimony, deliberations, findings, and recommendations occurring in the course of the review shall be deemed confidential and distributed only on a need-to-know basis.
- d. Relevant supervisors may also request of the Center Director that a Flight Status Review Board be appointed "before the fact" to aid that supervisor in his/her decision making process regarding a contemplated removal from flight status. In this case, the candidate for grounding may not waive his/her right to the review.

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CHAPTER 5: PHYSICAL EXAMINATIONS

1. ANNUAL PHYSICALS

- a. Dryden Flight Research Center aircrew must pass an annual aviation medical examination. Pilots must undergo the equivalent of a Class I FAA Medical examination. The results of the examination need not be forwarded to the FAA unless a FAA Medical Certificate is desired by the pilot. If the pilot performs Mission Management Aircraft operations, a Class I Medical Certificate issued in the last twelve months is required. Other flight crewmembers must pass the equivalent of a Class II FAA medical examination as specified on the [DFRC Form 176](#).
- b. Normally, the examination will be conducted at the established Dryden Health Unit. If conditions prevent a pilot from reporting to the contractor-operated clinic within the normal 12-month period, he/she will obtain a physical examination from a qualified FAA examiner, another NASA Center flight medicine clinic, or from a military flight surgeon. In this case, the pilot must ensure that adequate documentation covering the examination is forwarded to the Director for Flight Operations, and to the Dryden contractor-operated clinic.
- c. NASA pilots older than 55 years of age will be required to pass a flight physical every six months, meeting the requirements of above.

2. MEDICAL RECORDS

- a. The Dryden medical representative will receive the records of each individual aircrew physical examination, maintain these records in current status, and notify the Chief Pilot and the individual aircrew of the results of the annual physical examinations.
- b. It is the responsibility of the individual aircrew to schedule his/her annual physical examination prior to the expiration of his/her present qualification. The Chief, Flight Crew Branch will maintain a record of the individual's flight physical in the Life Support Office.

PREGNANCY TESTING

- a. Female aircrew will not be permitted to fly with known or suspected pregnancy. The only exception shall be, following the female aircrew's voluntary request and the approval of a flight surgeon and the Director of Flight Operations, she shall be permitted to fly in pressurized multi-crew, multi-engine, non-ejection seat aircraft from the 13th through the 24th week of gestation. Physiology training shall be waived during pregnancy.
- b. Female aircrew performing high altitude flights, requiring a pressure suit, will take a urine pregnancy test every 14 days at the Dryden Health Unit. Aircrew who are sterile are exempt from this requirement.

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- (1) If the pregnancy test is positive, the female aircrew will be removed from flight status and the test repeated in 48 hours. If the repeat test is positive, the female aircrew will be considered pregnant and restricted from all high altitude flights for the duration of the pregnancy. If the repeat test is negative, the test will be considered a false positive and the crewwoman returned to full flight status.
- (2) During periods of time when high altitude flights, requiring a pressure suit, are not anticipated for female aircrew, pregnancy tests may be suspended until 14 days prior to the next anticipated flight.

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CHAPTER 6: AIRCREW PHYSIOLOGICAL AND SURVIVAL TRAINING PROGRAM

1. POLICY

It is the policy of the Dryden Flight Research Center that all Center aircrew comply with physiological and survival training requirements in keeping with Air Force regulations pertaining to the Air Force Physiological Training Program and applicable survival training programs deemed appropriate for the Edwards AFB local flying area. Additional survival training may be required to support specific test or airborne science project deployments.

2. PHYSIOLOGICAL TRAINING PROCEDURES

- a. In keeping with agreements with Edwards Air Force Base authorities, the U. S. Air Force Physiological Training Program is available to all Dryden aircrew. Records on each aircrew for this training will be maintained by the Dryden Life Support Office who will maintain currency status and notify aircrew of required periodic physiological training. In addition, physiological training will be scheduled through the Life Support Office. Refresher training is required every five years.
- b. Aircrew requiring pressure suit refresher training will assure themselves that their training is broad enough that both pressure suit and routine refresher training are accomplished concurrently. In addition, prior to each flight utilizing a pressure suit, pilots will accomplish a suit functional run on the test console. ER-2 pilots will accomplish pressure suit refresher training in an altitude chamber, along with general physiological training every three years. Records of this training will be maintained by the ER-2 Operations.
- c. Physiological Training for High Altitude - Counter Pressure Garments (Jerkin or CHAGS System). Aircrew operating aircraft while using the Jerkin, CHAGS, or equivalent system shall complete the required original physiological training requirements and a ground level functional check every five years as a refresher-training requirement. In addition, prior to each flight using the Jerkin Suit, aircrew shall accomplish a suit function cockpit/console test and checkout.

3. SURVIVAL TRAINING REQUIREMENTS

- a. Primary and attached aircrew who participate regularly in flight operations will accomplish refresher water survival and land survival training every five years. This training is similar in nature to that provided to AFFTC flight crew personnel at Edwards AFB, but will also include training to cover unique or special equipment carried aboard NASA aircraft or in NASA survival kits. The training will normally be conducted in conjunction with normally offered courses at Edwards AFB. However, the Dryden Life Support Section will maintain the capability to conduct the above training, as required.

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- b. Specialized survival training will be scheduled for special operations outside the Edwards AFB local flying area, if deemed appropriate by the test project or directed by the Chief, Flight Crew Branch, Director for Flight Operations, the Air Worthiness and Flight Safety Review Board, or the Center Director. The project management or the Life Support Branch will arrange this specialized training. Identified personnel will either attend regularly scheduled military survival training courses at military facilities, specially schedule courses at Dryden conducted by certified survival training specialists, or other courses which are deemed appropriate to meet the project requirements in a timely manner.
- c. The Life Support Section will maintain all records pertaining to survival training, and will notify personnel of training due at least three months prior to the due date. Survival training conducted locally at Edwards AFB will be scheduled through the Life Support Section.

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CHAPTER 7: AUTHORIZATION OF AIRCRAFT PASSENGER FLIGHTS

1. POLICY

All aircraft assigned to the Dryden Flight Research Center are used as research vehicles in flight research operations and airborne science research, or as program support aircraft in the accomplishment of research programs. Use of Dryden controlled aircraft for transportation of program support personnel will be accomplished on a non-interference exception basis, subject to the approval of the Director for Flight Operations.

2. AUTHORIZATION OF PASSENGERS

- a. In keeping with Dryden policy, personnel authorized for passenger travel in Dryden aircraft will only be carried using Mission Management Aircraft procedures and must be one of the following.
 - (1) U. S. Government employees (civilian or military).
 - (2) NASA contractor personnel.
 - (3) Official advisors or consultants to the U. S. Government.
- b. Any local flight that plans to carry passengers will be requested by completion of Request for Air Transportation Services, [DFRC Form 115](#).

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CHAPTER 8: AEROSPACE PERSONAL EQUIPMENT INSPECTIONS

1. INSPECTION REQUIREMENTS

In direct support of the Dryden policy to ensure maximum safety and protection, a program of continuing and periodic inspections of aircrew equipment will be carried out under the direction of the Director for Flight Operations. This includes inspections of personal protective equipment, such as pressure suits, flight clothing, oxygen masks, helmets, parachutes, and life vests. It also includes inspections of personal protective equipment installed in aircraft, such as ejection seats, survival kits, and oxygen systems.

2. QUALIFIED TECHNICIANS PERFORM INSPECTIONS

Qualified aerospace personal equipment technicians perform all periodic inspections of standard equipment as required by appropriate military technical orders or as required by NASA directives where additional and special equipment or modifications to equipment are involved in connection with research flight operations. Records of all inspections are made to indicate equipment serviceability, use, and modifications. In addition, continuing preflight and postflight inspections are made to ensure maximum safety and effectiveness of equipment.

3. CHIEF, FLIGHT CREW BRANCH RESPONSIBILITY

The Chief, Flight Crew Branch is responsible for conducting periodic inspections of the aerospace personal equipment area and records to ensure technical adequacy and currency in equipment maintenance and inspection.

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CHAPTER 9: CHARTER AND MISSION MANAGEMENT AIRCRAFT OPERATIONS

1. CONTRACTING POLICY

Charter aircraft operations will be covered by a special contract for each operation.

2. CHARTER PASSENGER OPERATIONS

In the case of charter passenger operations for the Dryden Flight Research Center, the following guidelines are established:

- a. All operations must be conducted in accordance with "14 CFR Part 135".
- b. Multi-engine aircraft will be used with a two-pilot operation.

3. COORDINATION WITH ACQUISITION BRANCH

Any charter operation must be coordinated as early as possible with Dryden Acquisition Organization.

4. MISSION MANAGEMENT OPERATIONS

In the case of mission management operations for the Dryden Flight Research Center, the following guidelines are established:

- a. All operations must be conducted in accordance with "14 CFR Part 91".
- b. Multi-engine aircraft will be used with a two-pilot operation.
- c. Dryden pilots performing duties on Mission Management aircraft will meet the requirements of NPG 7900.3A Chapter 3 Mission Management Aircraft Operations.

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CHAPTER 10: AVIATION SAFETY PROGRAM

1. POLICY

It is the policy of the Dryden Flight Operations Directorate to eliminate all accidentally caused damage to equipment and property; or injury to personnel as a result of Dryden flight operations. To achieve this, the Dryden Flight Operations Directorate will maintain a comprehensive Aviation Safety Program. All Dryden Flight Operations Directorate personnel are expected to comply with and actively support the Dryden Aviation Safety Program.

2. SCOPE

This program applies to all activities involved in supporting Dryden flight operations including aircraft maintenance, engineering, and technical support.

3. ORGANIZATION

- a. A member of the Flight Crew Branch will be designated as the Aviation Safety Officer (ASO). This will be a collateral duty. The ASO will report directly to the Chief, Flight Crew Branch in a staff capacity, but will have direct access to the Center Director, Director, Dryden Flight Operations, and the Safety and Mission Assurance Chief. He/she also reports to the Dryden Chief Engineer who serves as a focal point for Aviation Safety.
- b. Because many of the aircraft operated at the Dryden Flight Research Center are unique or highly modified, the ASO is assisted in the accomplishment of his/her duties by each project pilot assigned to research projects in addressing safety related issues for all research aircraft operated at Dryden.

4. RESPONSIBILITY

a. Managers, Branch Chiefs, Supervisors, and Pilots

The responsibility for the safety of any Dryden flight operation is vested in the same individual(s) responsible for the success of the operation. Those with the authority to act, to commit resources, or to direct operations are responsible for using that authority as necessary to prevent mishaps. The Chief, Flight Crew Branch, or his/her designee will conduct a weekly meeting of all DFRC primary aircrew. The meeting will include a safety briefing by the Aviation Safety Officer (ASO). A suitable record of the meeting details will be kept on file.

b. Aviation Safety Officer (ASO)

- (1). The ASO serves as principal staff advisor to Chief, Flight Crew Branch and Director for Flight Operations on matters involving flight safety.
- (2). Develops and maintains the Dryden Flight Safety Program.

Fosters an attitude and environment conducive to aviation safety among all DFRC NASA/Government/Contractor pilots and other individuals involved in flight activities.

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- (3). Organizes Quarterly Flight Safety Meetings.
- (4). Investigates and reports flight mishaps within Dryden Flight Operations Directorate and assists in the investigation of flight mishaps conducted by NASA.
 - (a) Maintain records of all aircraft mishaps occurring during piloted operations and provide these reports to the Chief, Flight Crew Branch (OF), Director for Flight Operations (O), Safety and Mission Assurance Office (S), and the Center Director (X), as requested. Aircraft mishaps requiring a report include, but are not limited to:
 1. Situations which require declaring an emergency.
 2. Near misses.
 3. Foreign Object Damage (FOD).
 4. Bird Strikes.
 5. Physiological incidents.
 6. Inadvertent loss of control.
 7. Incidents due to weather factors.
 8. Hazardous air traffic control incidents.
 9. Dropped objects.
 - (b) Maintain records of all malfunctions which, in the opinion of the ASO, are of a seriousness or unusual nature sufficient to warrant being recorded and disseminated. Records of these malfunctions will be provided to the Chief, Flight Crew Branch (OF), Director for Flight Operations (O), Safety and Mission Assurance Office (S), and the Center Director (X), as requested. Aircraft malfunctions which could require a report include, but are not limited to:
 1. Engine problems, including loss of oil pressure, flameouts, stalls, surges, or problems which require shutdown.
 2. Flight control problems. Only dual FCS failures in the F-18 or F-16 aircraft need to be reported.
 3. Electrical problems such as generator failures.
 4. Hydraulic problems.
 5. Landing gear or flap problems.
 6. Brake problems.
 7. Nosewheel steering problems.

Pilots experiencing any of the above problems, or problems which, in the opinion of the aircraft commander, warrant a report, will fill out a hazard/incident report form which may be obtained from the ASO. All Dryden pilots, as well as pilots flying Dryden aircraft, are responsible for reporting the above hazards and incidents to the ASO.

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- (6). Provides flight safety training for new personnel.
- (7). Provides for distribution of flight safety information throughout Dryden Flight Operations Directorate.
- (8). Assigns hazard reports to the appropriate manager for processing and monitors their investigation and resolution.
- (9). Assists the Chief, Safety and Mission Assurance Office, in any inspections, surveys, or audits involving flight safety.
- (10). Acts as the focal point on all aviation safety matters:
 - (a) Acts in behalf of the Center Director and reports directly to the Chief Engineer when discharging this responsibility.
 - (b) Works in cooperation with the Directorate, Office of Flight Safety and Mission Assurance, and Center Director as necessary to promote flight safety.
 - (c) Maintains liaison with the Air Force Flight Test Center, Contractors, and operational units as appropriate, in order to ensure an exchange of safety information.
 - (d) Maintains liaison with ASOs at NASA Headquarters and other NASA aviation activities.
 - (e) Participates in such meetings, committees, panels, and working groups as necessary to maintain complete knowledge of matters affecting flight safety and to provide timely recommendations regarding flight safety.
- (11). Serves as Chairman of the Dryden Cockpit Safety Review Committee.

5. DISTRIBUTION OF FLIGHT SAFETY INFORMATION

Flight Crew Information File (FCIF) notices, Flight Publications distribution, flight safety meeting minutes, egress training dates and R2508 Airspace notices are displayed on the Aircrew Information and Flight Ops and Training Information bulletin boards. A crewmember's initials and date on the FCIF card and publication distribution card(s) indicates that he/she has received/reviewed the new information. A current FCIF card and egress training date are required for flight. The pilot-in-command is responsible for assuring that all crewmembers are current. Non-critical flight safety information is either, posted on the Flight Ops bulletin board, distributed directly to the crewmembers as received or briefed at the bi-monthly flight safety meetings. Due to the physical separation of the ER-2 operation from Bldg. 4800, a separate Flight Crew Information File applicable to the ER-2 will be maintained at ER-2 Operations in Hangar 1623.

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6. FLIGHT SAFETY TRAINING

The ASO will maintain an outline of flight safety subjects to be covered with new personnel. When required, he/she will conduct the training and maintain a record of training by name and date.

7. MISHAP INVESTIGATION

The ASO is appointed Investigation officer for all type B Accidents, Mission Failures, Test Failures, Incidents, and Near-Miss situations involving flight safety and Dryden flight operations. (See NASA NHB 1700.1, Vol. 1 for definitions.) This does not preclude the Center Director from subsequently appointing a Board of Investigation for any of the above mishaps. If a Board of Investigation is appointed, the ASO will normally serve as Aviation Safety Advisor to the Board. The ASO will prepare a report of any mishap he/she investigates in accordance with NASA directives.

8. HAZARD REPORTING

The ASO will maintain a Hazard Reporting Program wherein any Dryden employee noticing a situation which could affect flight safety can submit a report directly to the ASO. NASA-DFRC Aviation Hazard/Incident Report ([DFRC Form 165](#)) will be used for this purpose and will be available throughout the Dryden Flight Operations Directorate.

An employee wishing to file a Hazard Report should fill out the front side of the form as appropriate and send or deliver it directly to the Aviation Safety Officer. Reports may be submitted anonymously if desired.

On receipt, the ASO will determine the validity of the report, assign a number, and route an action copy to the official with the authority to correct the problem.

The action official will complete the reverse side of the form and return it to the ASO within five working days unless an additional period of time has been agreed upon.

The ASO will forward copy of the completed form (and action taken) to Director for Flight Operations through Chief, Flight Crew Branch; advise the originator (if known) of the action taken; and then maintain a file of the report.